UNITED STATES PATENT AND TRADEMARK OFFICE

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10/518,824	12/21/2004	Sebastien Baey	FR02 0064 US	9887

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EXAMINER
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ART UNIT	PAPER NUMBER
2616	

NOTIFICATION DATE	DELIVERY MODE
04/18/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

ip.department.us@nxp.com

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on _28 January 2008_.

2a) ☒ This action is **FINAL**.   2b) ☐ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) _1-14_ is/are pending in the application.

    4a) Of the above claim(s) _7_ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) _1-6 and 8-10_ is/are rejected.

7) ☒ Claim(s) _3 and 11-14_ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on _21 December 2004_ is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☒ All   b) ☐ Some * c) ☐ None of:

      1. ☒ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____.

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

2.   Claims 1, 2, 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Freiberg et al (US 6,788,657, Freiberg hereinafter) in view of Higuchi et al (US

2002/0012383, Higuchi hereinafter).

The present application is drawn to an "Adaptive Rate Matching Method".

Freiberg discloses a "universal mobile telephone system [UMTS] network with

improved rate matching method" (col. 1 lines 1-3) comprising the following features:

- **<u>Regarding Independent Claims 1, 8 and 9</u>**

Claim 1, *in a transmission system* (fig. 1, which "is a schematic view of a UMTS

network" recited col. 1 line 66) *for transmitting simultaneously at a global transmission*

power, corresponding to a global quality factor on reception, a set of various multiplexed

services (refer to fig. 1 and see "in a UMTS network in which a plurality of services of a

single user having different transmission power requirements are <u>multiplexed in one</u>

<u>channel</u> and the technique of rate matching is applied" recited col. 1 lines 46-49, noting

that such "multiplexed in one channel" will necessarily result in *transmitting*

simultaneously at a global transmission power, corresponding to a global quality factor

on reception) having specific predetermined error rate requirements (see "required to

achieve a <u>desired Bit Error Rate</u>" recited col. 1 lines 53-54) *matching individual quality*

factors (see "deriving for <u>each service</u> the <u>Energy per Bit per Noise density</u> E_B/N_o

required to achieve a desired Bit Error Rate" recited col. 1 lines 52-54, noting that

"$(E_B/N_o)_i$ indicates a QoS of service *i*" recited col. 8 line 21) *achievable with adequately*

adjusted current individual transmission powers (see "desired transmission quality

requirements of each transport channel is fulfilled and not significantly exceeded. This

means that <u>required transmission power</u> to meet quality requirement for <u>all transport</u>

<u>channels</u> is <u>as low as possible</u>" recited col. 2 lines 63-67), *a method of resource*

optimization (see "a method of calculating the number of bits to be punctured or

repeated to <u>achieve effective rate matching</u>" recited col.1 15-17) *comprising a step of*

balancing said current individual transmission powers with respect to, for a given

service (see "Semi-static Rate Matching: this is used to <u>balance the transmission power</u>

<u>requirements of different services</u>, which are multiplexed to one Common Composite

Traffic Channel (CCTrCH)" recited col. 3 lines 11-14), a desired bit *error rate* (see "to

achieve the desired Bit Error Rate BER" recited col. 3 lines 34-35).

Claim 8, *a transmission system* (fig. 1, "a schematic view of a UMTS network"

recited col. 1 line 66) *comprising an emitting entity* (fig. 1 "UE 12" and "UE 14" or

"mobile users 12, 14" recited col. 2 line 14) *and a receiving entity* (fig. 1 "Node B 16" or

"base station BTS/Node B 16" recited col. 2 lines 14-15) *for transmitting simultaneously*

at a global transmission power a set of various multiplexed services (refer to fig. 1 and

see "in a UMTS network in which a plurality of services of a single user having different

transmission power requirements are <u>multiplexed in one channel</u> and the technique of rate matching is applied" recited col. 1 lines 46-49, noting that such "multiplexed in one channel" will necessarily result in *transmitting simultaneously at a global transmission power*) *having specific predetermined error rate requirements* (see "required to achieve a <u>desired Bit Error Rate</u>" recited col. 1 lines 53-54) *matching quality factors* (see "deriving for <u>each service</u> the <u>Energy per Bit per Noise density</u> E_B/N_o required to achieve a desired Bit Error Rate" recited col. 1 lines 52-54, noting that "$(E_B/N_o)_i$ indicates a QoS of service *i*" recited col. 8 line 21) *achievable with adequately adjusted current individual transmission powers* (see "desired transmission quality requirements of each transport channel is fulfilled and not significantly exceeded. This means that <u>required transmission power</u> to meet quality requirement for <u>all transport channels</u> is <u>as low as possible</u>" recited col. 2 lines 63-67), *the transmission system comprising resource optimization means* (fig. 2 "Rate Matching 45/55" means) *including means of balancing said current individual transmission powers with respect to, for a given service* (see "Semi-static Rate Matching: this is used to <u>balance the transmission power requirements of different services</u>, which are multiplexed to one Common Composite Traffic Channel (CCTrCH)" recited col. 3 lines 11-14), *a desired bit error rate* (see "to achieve the desired Bit Error Rate BER" recited col. 3 lines 34-35).

Claim 9, *in a transmission system* (fig. 1, "a schematic view of a UMTS network" recited col. 1 line 66) *comprising an emitting entity* (fig. 1 "Node B 16" or "base station BTS/Node B 16" recited col. 2 lines 14-15) *and a receiving entity* (fig. 1 "UE 12" and "UE 14" or "mobile users 12, 14" recited col. 2 line 14, noting that Freiberg discloses "This

entire procedure exists also in the downlink direction, ie from the BTS 16 to mobile 12 or

14" recited col. 2 lines 47-48) *for transmitting simultaneously at a global transmission*

power a set of various multiplexed services (refer to fig. 1 and see "in a UMTS network

in which a plurality of services of a single user having different transmission power

requirements are multiplexed in one channel and the technique of rate matching is

applied" recited col. 1 lines 46-49, noting that such "multiplexed in one channel" will

necessarily result in *transmitting simultaneously at a global transmission power*) *having*

specific predetermined error rate requirements (see "required to achieve a desired Bit

Error Rate" recited col. 1 lines 53-54) *matching quality factors* (see "deriving for each

service the Energy per Bit per Noise density E_B/N_o required to achieve a desired Bit

Error Rate" recited col. 1 lines 52-54, noting that "$(E_B/N_o)_i$ indicates a QoS of service i"

recited col. 8 line 21) *achievable with adequately adjusted current individual*

transmission powers (see "desired transmission quality requirements of each transport

channel is fulfilled and not significantly exceeded. This means that required

transmission power to meet quality requirement for all transport channels is as low as

possible" recited col. 2 lines 63-67), *the receiving entity* (fig. 1 mobile 12 or 14)

comprising resource optimization means (fig. 2 "Rate Matching 45/55" means) *including*

means of balancing said current individual transmission powers with respect to, for a

given service (see "Semi-static Rate Matching: this is used to balance the transmission

power requirements of different services, which are multiplexed to one Common

Composite Traffic Channel (CCTrCH)" recited col. 3 lines 11-14), a desired bit *error*

Rate (see "to achieve the desired Bit Error Rate BER" recited col. 3 lines 34-35).

Freiberg does not expressly disclose the following feature (underlined part below)

for all of above Independent claims 1, 8 and 9:

… balancing said current individual transmission powers with respect to an

estimation, for a given service, <u>of a difference between said specified predetermined</u>

<u>error rate requirement and a measured current error rate</u>. However, since Freiberg has

already taught to perform the same *with respect to* <u>achieving the desired Bit Error Rate</u>

<u>PER</u> as cited above, there would have been obvious and would have no difficulty for

Freiberg to do the same as what is shown in Higuchi.

Higuchi discloses a "transmission power control method and mobile

communication system" (p1 left col. lines 1-2) comprising, <u>regarding claims 1, 8 and 9:</u>

balancing said current individual transmission powers with respect to an

estimation, for a given service, <u>of a difference between said specified predetermined</u>

<u>error rate requirement and a measured current error rate</u> (see "varying … the amount of

correction of the <u>target reception power value</u>, according to the <u>difference between</u> the

<u>detected</u> reception <u>error rate</u> and the <u>target</u> reception <u>error rate</u>" recited p7 right col.

claim 6 lines 3-8, and in tern "the <u>transmission power</u> can be controlled to a

predetermined target value based on [the SIR or] the <u>target reception power value</u>"

recited Abstract lines 7-9).

Therefore, it would have been obvious to one of ordinary skill in the art at the

time of the invention to modify the method of Freiberg by adding the method of Higuchi

of adjusting transmission power per error rate difference in order to provide a more

stable system "in which transmission power control capable of realizing a constant

reception quality (communication quality) can be performed regardless of the change in the propagation environment such as the change in the number of multipath, the mobile station velocity or the like" (Higuchi, [0016] lines 5-9).

- **Regarding Dependent Claims**

Freiberg discloses the following features:

Claim 2, *a method as claimed in claim 1, wherein the step of balancing the current individual power includes dynamically adapting rate matching parameters associated to the services, which are related to a number of bits to be repeated or punctured during transmission of said services* (see "… a method of determining for each service the <u>number of bits to be punctured or repeated</u> to provide rate matching" recited Abstract lines 3-5).

Claim 10, *a computer program product for a receiver computing a set of instructions, which when loaded into the receiver, causes the receiver to carry out the method as claimed in claim 1* (It is obvious to one skilled in the art that Freiberg's method will have to be performed with *a computer program product for a receiver computing a set of instructions, which when loaded into the receiver, causes the receiver to carry out the method,* noting especially that in Freiberg's method "the mobiles can <u>calculate</u> from the received values and the values <u>stored in the look up table</u> the number of bits to be punctured or repeated" recited Abstract last three lines).

3.   Claims 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Freiberg in view of Setty et al (US 2003/0103469, Setty hereinafter).

The present application is drawn to an "Adaptive Rate Matching Method".

Freiberg discloses a "universal mobile telephone system [UMTS] network with improved rate matching method" (col. 1 lines 1-3) comprising the following features:

Regarding Claim 4, *in a transmission system* (fig. 1, which "is a schematic view of a UMTS network" recited col. 1 line 66) *for transmitting simultaneously at a global transmission power, a set of various multiplexed services* (refer to fig. 1 and see "in a UMTS network in which a plurality of services of a single user having different transmission power requirements are multiplexed in one channel and the technique of rate matching is applied" recited col. 1 lines 46-49, noting that such "multiplexed in one channel" will necessarily result in *transmitting simultaneously at a global transmission power*) *comprising a set of transport data blocks of various predetermined sizes for transporting block-coded data on specific transport channels* (see "An additional requirement is that the semi-static rate matched transport block must fit into a physical channel having bits per frame N_{Frame}. One time frame is 10 milliseconds and contains N_s symbol bits where $N_s = 16 \cdot \sum N_{dataj}$" recited col. 4 lines 43-50) *having specific predetermined error rate requirements* (see "required to achieve a desired Bit Error Rate" recited col. 1 lines 53-54) *associated to quality factors* (see "deriving for each service the Energy per Bit per Noise density E_B/N_o required to achieve a desired Bit Error Rate" recited col. 1 lines 52-54, noting that "$(E_B/N_o)_i$ indicates a QoS of service i" recited col. 8 line 21), *which necessitate adequately adjusted current individual transmission powers* (see "desired transmission quality requirements of each transport channel is fulfilled and not significantly exceeded. This means that required transmission power to meet quality requirement for all transport channels is as low as

possible" recited col. 2 lines 63-67), *a method of resource optimization* (see "a method

of calculating the number of bits to be punctured or repeated to <u>achieve effective rate</u>

<u>matching</u>" recited col.1 15-17) *including a step of balancing said current individual*

transmission powers (see "Semi-static Rate Matching: this is used to <u>balance the</u>

<u>transmission power requirements of different services</u>, which are multiplexed to one

Common Composite Traffic Channel (CCTrCH)" recited col. 3 lines 11-14), *wherein the*

step of balancing said current individual transmission powers includes a step of

estimating code block size coding gains related to the transport data blocks for deriving

individual quality factors matching said specific predetermined error rate requirements

(see "After the channel coding step, which is specific to the service *i* and is described by

the coding factor (<u>coding gain</u>) CF_i, when the number of coded bit $N_{codi}=N_{biti} \cdot CF_i$. This

value is the <u>input</u> to a rate matching step, the <u>output</u> of which is $(E_S/N_o)_i$, the QoS after

the coding and rate matching" recited col. 8 lines 22-26).

    Regarding claim 5, *the step of balancing the current individual transmission*

powers includes a step of dynamically adapting at code block size change rate

matching parameters associated to the services, which are related to a number of bits

to be repeated or punctured during transmission of said services (see "… a method of

determining for each service the <u>number of bits to be punctured or repeated</u> to provide

rate matching" recited Abstract lines 3-5).

    Regarding claim 6, *wherein the step of dynamically adapting at code block size*

change rate matching parameters associated to the services includes a preliminary step

of determining groups within the set of transport data blocks, a same group comprising

transport data blocks associated to quality factors, which may differ only within a

predefined rage (refer to fig. 2 and see "the steps to encode services with <u>identical QoS</u>

<u>requirements</u> are shown within <u>box 30</u>, and identical steps to encode a set of <u>different</u>

<u>services</u> are performed within <u>box 31</u>" recited col. 2 lines 29-32), *and a step of*

computing the rate matching parameters with respect to a predetermined rule

corresponding to the associated quality factor of the group (still refer to fig. 2, especially

box 30, and see, as a follow-up step to the above cited step, "rate matching step 45"

recited col. 2 lines 36-37, and "the equivalent rate matching step 55 is shown in box 31"

recited col. 2 line 38, and further "the <u>rate matching factor</u> for <u>each service</u> is calculated

by $RF_i = DRF \cdot SRF_i$" recited col. 6 lines 4-5, noting the subscript "*i*" suggests that the RF

is different from one service to another).

Freiberg does not disclose the following feature:

Regarding claim 4, said power balancing is performed *<u>with respect to the</u>*

<u>predetermined sizes of said transport data blocks</u>.

Setty discloses a "method and apparatus for controlling the transmission power

in radio communication system" (p1 left col. lines 1-3) wherein "rate matching is applied"

([0002] line 12) comprising the following feature:

Regarding claim 4, balancing transmission power *<u>with respect to the</u>*

<u>predetermined sizes of said transport data blocks</u> (see "adjusting the transmission

power of the system according to a relationship between the size of a Midample signal

and <u>the size of a data signal with a transmission burst</u>" recited [0011]).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Freiberg by adding the aforesaid step of Setty to Freiberg in order to provide an expanded method and system "for controlling the T_x power during the rate matching in a TDD system" as pointed out by Setty ([0005] lines 1-3), which was needed because "there are no provisions for controlling the T_x power in a TDD wireless telecommunication system" as Setty said ([0004]) and further "by reducing the T_x power requirements during rate matching, the overall power requirements of the wireless telecommunication system and the system's costs are reduced" ([0005] lines 3-6).

Allowable Subject Matter

4.   Claims 3 and 11-14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 3 and 11-14 essentially cite the same set of unique steps for carrying out adaptive rate matching method for matching the specific predetermined error rate requirement of given quality of services. These claims appear to contain allowable subject matters. The closest prior art of Freiberg and Higuchi, as cited above in sections 2 and 3, provided conventional method of rate matching in a wireless communication system with transmission power adjustments or balancing for individual services to meet data error requirements. However, said closest prior arts, singularly or in combination, fail to teach the particular and unique steps claimed in claims 3 and 11-14 of present Application regarding transmission power balancing and rate matching.

Response to Arguments

5.   Applicant's arguments filed on 1/28/2008 have been fully considered but they are

not persuasive.

Regarding claim 1 in its original form, Applicant argues over Higuchi with

respect to the "estimate of a difference between the specific predetermined error rate

and a measured current error rate" by stating (page 15 third paragraph) "Controlling power

according to a difference between a detected reception error rate and a target rate is not the same as

balancing a current individual transmission power with respect to an estimate, for a given service, of a

difference between the specific predetermined error rate requirement and a measured current error rate

because Higuchi is concerned with controlling power based on the actual measured difference between a

detected reception error rate and a target reception rate, and not an estimate of the difference".

Examiner respectfully disagrees with these arguments based on the following

points:

A. Let's first take a look at what the "estimate" is. It is, as claimed, "an estimate

… of a difference between the specific predetermined error rate requirement and a

measured current error rate". Mathematically, this is an estimate of $\varDelta = E_{req} - E_{cur}$

wherein the requirement error rate E_{req} is "specific predetermined" as claimed and the

current error rate E_{cur} is "measured" also as claimed. In other words, the "difference"

between the two is a mathematically deterministic value (except that measured values,

as well known in the art and of common sense, may carry random fluctuations and/or

systematical errors, which is however the same to everyone). One can still call it an

"estimate", but it does not change the deterministic nature of the final result once the

current error rate is "measured". This is exactly the same as Higuchi's $\Delta = E_{targ} - E_{dtct}$

wherein the target E_{targ} is "specific predetermined" and the detected E_{dtct} is "measured".

B. In more general terms, it is well known to one skilled in the art that any

technological estimate of a quantity, such as a radio signal, will have to be based on

certain prior knowledge from real data. Even a theoretical prediction will have to be

tested and verified with experimental data before it can be used for real-time estimate or

prediction.

C. More particularly, Applicant disclosed also in the Specification that such

"estimate" is based on the result of actual measurement by stating (Specification page

12 lines 21-23) "During transmission, <u>measure</u> on receiving side actual BER/BLER

performance on each TrCH and corresponding E_s/N_0 and <u>derive a better estimate</u> of

TrCH current performance curve".

Regarding claim 4 as amended, Applicant argues over Setty in regarding to

balancing transmission power "with respect to the predetermined sizes of said transport

data blocks" by stating (page 16 last paragraph) "Setty relates to adjusting the transmission the

transmission power of the system according to a relationship between the size of a midamble signal and

the size of a data signal with a transmission burst", which, as Applicant continuous (the same paragraph)

"is not the same as balancing said current individual transmission powers with respect to predetermined

sizes of said transport data blocks".

Examiner respectfully disagrees. It is obvious to one skilled in the art and of

common sense in fact that if the "relationship" involves "the size of a data signal", the

associated "adjusting" will have to <u>comprise</u> considering the size of the same first, or

said "relationship" can never be correctly established.

Applicant also argues over Freiberg in regarding to "estimating coding gains" by

stating (page 17 second paragraph) "using a coding gain as an input to a rate matching step is not

the same as estimating code block size coding gains" and further (the same paragraph) "Freiberg

appears to be silent in regards to estimating code block size coding gains".

Examiner respectfully disagrees. Freiberg clearly provides "After the channel

coding step, which is specific to the service i and is described by the coding factor

(coding gain) CF_i, when the number of coded bit $N_{codi}=N_{biti} \cdot CF_i$", col. 8 lines 22-26. It is

obvious to one skilled in the art that said "coding gain" CF_i will have to be determined in

order to calculate $N_{codi}=N_{biti} \cdot CF_i$. Also, Examiner tries to find where in the Specification

the Applicant provide the details of said "estimating", in view of Applicant's argument

over claim 1 regarding the "estimating" therein, which turns out to be determining as

discussed above. It appears to the Examiner however that the only place this is

mentioned is on page 15 of the Specification second paragraph "... includes a step of

estimating the code block size coding gains..." with no more information than what's

stated in the Specification. On the other hand, on page 16 second paragraph, Applicant

states "The RM parameters of other TFCs in the group could be computed internally in

the emitting side taking code block size and associated gain into account". Although

indirectly, this provides a suggestion that said "estimating" is in fact "computing",

equivalent to determining, which is also what is required in Freiberg's $N_{codi}=N_{biti} \cdot CF_i$ as

discussed hereinabove.

Finally, Applicant's brief arguments over the dependent claims are entirely depending on the issues of their independent claims, which have hereinabove addressed.

Conclusion

6.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US 2002/0115443 provides a method for controlling quality of service in a CDMA-based wireless system using static rate matching and power-offset dynamically.

US 2004/0018849 discloses a queue length-based data transmission for wireless communication wherein transmission power is adjusted in accordance with the amount of data in the queue.

7.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Lai whose telephone number is 571-272-9741. The examiner can normally be reached on M-F 7:30-5:00 EST, Off alternative Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kwang Yao can be reached on 571-272-3182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Andrew Lai/
Examiner, Art Unit 2616

/Kwang B. Yao/
Supervisory Patent Examiner, Art Unit 2616